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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/789,100	02/27/2004	Douglas S. Lacy	030048107US	7692

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EXAMINER	
HOLZEN, STEPHEN A	

ART UNIT	PAPER NUMBER
3644	

DATE MAILED: 08/08/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/789,100	LACY ET AL.	
	Examiner	Art Unit	
	Stephen A. Holzen	3644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 May 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *29,31-38,41-44 and 47-50* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *29, 31-38, 41-44, 47-50* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *5/23/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 29, 31-38, 41-44, 47-50 have been considered but are moot in view of the new ground(s) of rejection.

2. It should be understood that the examiner has reconsidered the teachings of Wakayama in view of applicant's claim language. Applicant should appreciate the breadth of the language presently employed.

3. The examiner would like to address one issue that the applicant raised in the reply filed on 5/23/2006. Applicant argued that Wakayama is directed toward the trailing edge devices. The examiner agrees. The examiner would also like to point out the Wakayama teaches leading edge slats in combination with a controller and independently actuated trailing edge flaps. Wakayama does not specifically illustrate the leading edge slats but he/she discloses the combination in ¶0042 (and elsewhere).

4. Flaps are hinged surfaces on the trailing edge of the wings of a fixed-wing aircraft which, when deployed, increase the lift and drag of a wing. Lift is increased by increasing the camber of the wing and by increasing the size of the effective lifting surface by increasing the wetted area. Flaps are usually fully extended while landing to allow the aircraft to fly more slowly (by increasing the lift generated by the wings at slow speeds) and to steepen the approach to the landing site. Depending on the aircraft type,

configuration and method of takeoff (e.g., short field, soft field, normal, etc.), flaps are often partially extended for take-off to give the aircraft more lift when trying to leave the ground.[1]

5. Slats are small aerodynamic surfaces on the leading edge of the wings of fixed-wing aircraft which, when deployed, allow the wing to operate at a higher angle of attack. Lift is a product of angle of attack and speed, so by deploying slats an aircraft can fly slower or take off and land in a shorter distance. They are usually used while landing or performing maneuvers that take the aircraft close to the stall, but are usually retracted in normal flight to minimize drag. Slats, also known as leading-edge flaps, have a similar purpose to trailing edge flaps; save they are located on the leading edge of the wing.[2,3]

6. The applicant should appreciate that paragraphs 4 and 5 above are taken directly from Wikipedia.org. The dates of these documents disqualify them as references. The examiner asserts however, that these paragraphs merely highlight the level of skill in the art at the time slats and flaps were invented. See for example F. E. Flader et al (2,422,296) that details an aircraft having both leading and trailing edge flaps being

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[1] "Flap (aircraft)." Wikipedia, The Free Encyclopedia. 3 Aug 2006, 10:18 UTC. Wikimedia Foundation, Inc. 5 Aug 2006 <http://en.wikipedia.org/w/index.php?title=Flap_%28aircraft%29&oldid=67413665>.

[2] Id.

[3] "Slats." Wikipedia, The Free Encyclopedia. 27 Jun 2006, 12:32 UTC. Wikimedia Foundation, Inc. 5 Aug 2006 <http://en.wikipedia.org/w/index.php?title=Slats&oldid=60827639>.

used for increasing lift (by increasing the chamber and the wing's chord length). See Col. 1, lines 48 – Col. 2, lines 4. It is the examiner's position that everything discussed in paragraphs 4 and 5 were therefore known by at least June 17, 1947 (as evidenced by F. E. Flader et al).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 29, 31-38, 41-44 and 47-50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wakayama (2003/0197097). Wakayama discloses

> Independently deflectable control surfaces located on the trailing edge of the wing of a blended wing-body aircraft. The reconfiguration control system of the present invention controls the deflection of each control surface to optimize the spanwise lift distribution across the wing for each of several flight conditions, e.g., cruise, pitch maneuver, and high lift at low speed. The control surfaces are deflected and reconfigured to their predetermined optimal positions when the aircraft is in each of the aforementioned flight conditions. With respect to cruise, the reconfiguration control system will maximize the lift to drag ratio and keep the aircraft trimmed at a stable angle of attack. To optimize high lift at low speed,

during take-off and landing for example, the control surfaces are reconfigured to increase the local maximum coefficient of lift at stall-critical spanwise locations while providing pitch trim with control surfaces that are not stall critical. (See abstract)

Wakayama discloses that the primary consideration for low speed conditions (takeoff and landing) is maximizing lift. At low speeds, the control surfaces are configured to improve maximum lift and delay stall

Although Wakayama's preferred embodiment is implemented in a blended wing-body aircraft, it could also be used to optimize the aerodynamic characteristics and to reduce the weight of a conventional wing on a conventional aircraft having a tubular fuselage and an appended tail section, such as aircraft 20. (See paragraph 0041)

Furthermore, Wakayama teaches that the trailing edge devices can be used in combination with leading edge slats. (See Paragraphs 0041 & 0042).

It is the examiner's opinion that Wakayama makes two very important disclosures.

- That it is known to control the movement of "control surfaces" independent from one another and in different directions. (see for example Figure 6).
- That it is known in the art to use a controller to reconfigure the control surfaces and the resulting spanwise lift distribution of an aircraft to optimize its aerodynamic characteristics in a number of flight regimes. The amount and direction of the deflection of each control surfaces the spanwise lift distribution across the wing for each of a variety of flight conditions. The control surfaces are deflected and reconfigured to their predetermined optimum position when the aircraft is in each of those flight conditions (cruise, pitching, take off, landing).

The major difference between Wakayama and the present invention is that Wakayama is primarily concerned with actuation of the trailing edge control surfaces (flaps), while the present invention is primarily concerned with the actuation of the leading edge control surfaces (slats or flaps).

In addition to the discussion above (paragraphs 4-6), the examiner asserts that trailing edge flaps and leading edges slats/flaps have:

- Substantially the same purpose (to increase lift),
- Have substantially similar (although opposite) movements,

- Have similar attachments (hinges, bearings, etc.),
- Are deployed by substantially similar actuators (hydraulic, pneumatic, etc.)
- Are similarly controlled (deploy during landing and takeoff, stow during cruise).

The examiner concludes then that it would have been obvious to one having ordinary skill in the art, at the time the invention was made to employ the reconfiguration control system of Wakayama to reconfigure the leading edge cord length to maximize the lift to drag ratio and thus to optimize the spanewise lift distribution across the wing for each of a plurality of leading edge devices for a plurality of different flight conditions (cruise, pitch, maneuver, take off and landing) for the purpose increasing fuel efficiencies.

Re – Claim 31: Figures 5-7 illustrate that Wakayama teaches that it is known to control the control surfaces such that they have a spanwise taper. Figure 6 illustrates a taper in two different directions.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Bliesner et al (5,056,741) discloses that it is known to taper the leading edge of a fixed portion of a wing for the purpose of increasing spanwise lift distributions (see Figure 14). These tapers are typically covered during cruising, however they are exposed during take off and landings. It should be noted that the examiner has asserted that Wakayama provides the motivation to make obvious the present invention. However, if the applicant were to successfully argue that there is no motivation to modify Wakayama to have different leading edge spanwise lift distributions the examiner would use this reference to provide such motivation.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen A. Holzen whose telephone number is 571-272-6903. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Teri Luu can be reached on 571-272-7045. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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